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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,200	01/11/2006	Takashi Kariya	282371US90PCT	7428
22850 7590 01/25/2010 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER ABRAMS, NEIL				
ART UNIT 2839		PAPER NUMBER		
NOTIFICATION DATE 01/25/2010		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary

Application No.

10/564,200

Applicant(s)

KARIYA ET AL.

Examiner

Neil Abrams

Art Unit

2839

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/GS/US)
Paper No(s)/Mail Date 4-6-2009

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. In view of the appeal brief filed on 09/02/2009, PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/T C Patel/
Supervisory Patent Examiner, Art Unit 2839

The Ohuchi and Lee references, cited in the IDS submitted 4-6-2009 are applied in the new ground of rejection

2. Claims 1-3, 5-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over (US patents) Ohuchi in view of Harrell, Barrett, Lee, Soga, Mikubo and Milkovich .
3. For claims, 1, 11, Ohuchi, figure 1, includes an interposer 3 to be located between a substrate 9 and an IC chip 1, the interposer including an insulative base material having in one

case a Youngs modules of 10, 000 Kg/mm which is about 98 GPa and is depicted to have a thickness that appears to clearly be within the recited ratio of 0.05 to 1.5 times the thickness of the substrate 9 and also to have a plurality of holes 6 that include conductors for connecting the substrate 9 and chip 1.

4. Ohuchi lacks disclosure of the holes in the recited diameter range and of the holes being in form of a grid or for claim 11, lacks disclosure of a staggered grid. The use of grids for interposer holes including staggered grids is shown in Barrett, figures 1, 2, Lee, figures 4, 4A, 9 and Harrell, figures 2, 4. Obvious to use such grid feature in Ohuchi and for claim 11 to use a staggered grid. With these arrangements a larger numbers of circuit paths is possible. As to hole size it would have been obvious to select the smallest hole size necessary to achieve the desired current. So applied, Ohuchi is fully adequate for claims 1 and 11.

In addition, for the hole size feature, note Milkovich column 6, lines 65-67, reference to "4 mils" for size of pads at ends of holes, the holes then likely having diameters in range of about 2 to 3 mil. Such dimensions, even if hole size 4 mils, is within the recited claims 1, 11 range.

Obvious to use such 4 mils or less size for Ohuchi holes to provide a small size component. As to insulation base thickness limitations while Ohuchi is seen as entirely sufficient, interposer bases within the recited ratio range are also shown in Harrell, figure 1 at 113, Soga at 9, Barrett at 10 and Mikubo at 3. Also obvious, should the matter be at issue, to use such relationships for Ohuchi interposer base since that appears to be a standard way to form such interposer to minimize size of the assembly. In case any issue arises as to use of the Ohuchi interposer, it is also submitted that it would necessarily function to transmit currents in the manner clearly taught by Soga at 9, 11, Barrett at 10, 18 and Milkovich figure 6.

5. In the last response, no arguments are presented for claims 2, 3, 5-7, 9-16, 18, 19 and these do not appear to be at issue, however, for clarification of the record, the following is stated. Claims 2, 4, 12, 14, relate only to features of the substrate and not of the interposer, hence cannot be relied upon to avoid the rejection.
6. For claims 9, 18 and as alternative for claims 2, 5, 12, 14 Ohuchi lacks multilayer substrate. Mikubo at 6 includes such type substrate. Obvious to use such features in place of 9 of Ohuchi to enable greater number of circuit connections.
7. For claims 6, 7, 15, 16 also obvious to provide Ohuchi base with plated holes or holes filled with solder (paste) in view of Milkovich at 11, 10 to provide good conductivity through the interposer.
8. For claim 20, Ohuchi lacks ground or power vias. Harrell at 121, 122 and Lee at 72 includes such features. Obvious to include such type vias in Ohuchi interposer to enable proper operation of the IC 1.
9. For claims 21, 22, Ohuchi modified as discussed above is adequate.
10. Applicant's arguments filed with the last amendment have been fully considered but they are not persuasive.
11. Basically, the claims 1, 11 limitations of "0.05 to 1.5" ratio is seen as very broad and to cover almost all standard arrangements of interposers and substrates. Therefore references teachings even if not to scale should be adequate in this regard. Nor do applicants assert that such relationship or that the recited "hole size range" are not typical in the art. The "grid" and "staggered grid" features are also seen to be standard expedients for ICs and interposers, even apart from cited references.

Art Unit: 2839

12. The cited US patent to Ikeda is noted to be equivalent to the previously cited Ikeda Japan patent

Any inquiry concerning this communication should be directed to Neil Abrams at telephone number 571-272-2089

/Neil Abrams/

Primary Examiner, Art Unit 2839